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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/575,716	04/13/2006	Shinichi Kaga	2006-0543A	3530

513 7590 05/12/2009

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EXAMINER	
COX, ALEXIS K	
ART UNIT	PAPER NUMBER
3744	

MAIL DATE	DELIVERY MODE
05/12/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/575,716	KAGA ET AL.	
	Examiner	Art Unit	
	ALEXIS K. COX	3744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 January 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *17-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *17-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *1/30/2009*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim35 is objected to because of the following informalities: on line 16 of the claim, the term "the one of the" should be changed to "one of the" to increase the clarity of the claim language. Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 35 and 36 are rejected under 35 U.S.C. 102 (b) as being anticipated by Kobayashi et al (US Patent No. 4,662,185).

Regarding claim 35, Kobayashi et al discloses a refrigerating storage cabinet (refrigerator, see column 1 line 8) for refrigerating an inner atmosphere and including a refrigeration unit comprising a compressor (see column 1 line 9) including a plurality of performance levels (see column 2 lines 31-35) and an evaporator which is inherently present in order to cool the interior of the refrigerator of Kobayashi et al, a storing unit (5, see column 2 lines 16-17) configured to store a plurality of cooling characteristics including a target physical amount as a function of operating time (2, Ts, see column 2 lines 25-26), a physical amount sensor configured to detect a physical amount at predetermined intervals of operating time (1, Ta, see column 2 lines 23-25 and lines 57-

58); and an operation control unit (5, see column 2 lines 16-17 and 29-35) configured to control the compressor by selecting one of the plurality of performance levels based upon a relationship between the physical amount and the target physical amount for one of the predetermined intervals of operating time; and the operational control unit is configured to select an appropriate one of the cooling characteristics based upon the physical amount, wherein the target physical amount is determined from one of the plurality of cooling characteristics (see column 2 lines 48-68).

Regarding claim 36, the physical amount is the temperature of the inner atmosphere (see column 2 lines 23-25), the target physical amount is a temperature (Ta, Ts, see column 2 lines 26-28), the cooling characteristic is a pull down characteristic (see column 2 lines 48-552) while the physical amount is in a temperature range from above a high temperature to near a set temperature, and the high temperature is higher than the set temperature by more than a predetermined value. Further, Kobayashi et al discloses the refrigerating storage unit to comprise an upper limit temperature that is higher by the predetermined value than a set temperature (Dn, see column 2 line 48), a lower limit temperature that is lower by the predetermined value than the set temperature (Dm, see column 2 line 54), a control-cooling zone between and including the upper limit temperature to the lower limit temperature (Dm, Dn, see column 2 lines 53-58, see also figure 2) wherein when the physical amount is in the control-cooling zone, the cooling characteristic is a control-cooling characteristic; wherein when the physical amount reaches the lower limit temperature from a temperature higher than the lower limit temperature, the compressor is not operated

(see column 3 lines 18-20); wherein when the physical amount reaches the upper limit temperature from a temperature lower than the upper limit temperature, the compressor is operationally controlled by the operation control unit (see column 2 lines 31-35).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 17-23, 25, 26, 28, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi et al (US Patent No. 4,662,185) in view of Stamp (US Patent No. 4,328,680).

Regarding claim 17, Kobayashi et al discloses a refrigerating storage cabinet (refrigerator, see column 1 line 8) for refrigerating an inner atmosphere and including a refrigeration unit comprising a compressor (see column 1 line 9) and an evaporator which is inherently present in order to cool the interior of the refrigerator of Kobayashi et al, the compressor including a plurality of performance levels (see column 1 lines 8-10), a storing unit (5, see column 2 lines 16-17) configured to store a cooling characteristic including a target physical amount as a function of operating time (2, Ts, see column 2 lines 23-25 and 57-58), a physical amount sensor which detects a physical amount at predetermined intervals of operating time (1, Ta, see column 2 lines 23-25 and 57-58); an operation control unit (5, see column 2 lines 16-17 and 29-35) which controls the compressor by selecting one of the plurality of performance levels based upon a relationship between the physical amount and the target physical amount for one of the predetermined intervals of operating time (see column 2 lines 31-35 and 58-68). It is noted that Kobayashi does not explicitly disclose the target physical amount to vary with operating time. Stamp does explicitly disclose this programming feature (see abstract lines 1-3). As such, it would have been obvious to one of ordinary skill in the art at the time of the invention to program the system of Kobayashi to vary temperature with time as is done in Stamp in order to control the system with greater efficiency.

Regarding claim 18, Kobayashi discloses the physical amount to be a temperature of the inner atmosphere (Ta, see column 2 lines 23-25), the target physical amount to be a temperature (Ts, see column 2 lines 26-28), the cooling characteristic to be a pull down characteristic when the physical amount is in a temperature range from above a high temperature to near a set temperature (see column 2 lines 48-52); and the high temperature is higher than the set temperature by more than a predetermined value.

Regarding claim 19, Kobayashi et al discloses the refrigerating storage unit to comprise an upper limit temperature that is higher by the predetermined value than a set temperature (Dn, see column 2 line 48), a lower limit temperature that is lower by the predetermined value than the set temperature (Dm, see column 2 line 54), a control-cooling zone between and including the upper limit temperature to the lower limit temperature (Dm, Dn, see column 2 lines 53-58, see also figure 2) wherein when the physical amount is in the control-cooling zone, the cooling characteristic is a control-cooling characteristic; wherein when the physical amount reaches the lower limit temperature from a temperature higher than the lower limit temperature, the compressor is not operated (see column 3 lines 18-20); wherein when the physical amount reaches the upper limit temperature from a temperature lower than the upper limit temperature, the compressor is operationally controlled by the operation control unit (see column 2 lines 31-35).

Regarding claim 20, the refrigerating storage cabinet of Kobayashi et al comprises a speed-controllable inverter compressor (6, 7, see column 2 lines 19-21),

with the operation control unit comprises a physical amount change computing section configured to compute a physical amount reduction degree at the predetermined intervals of operating time (1, see column 2 lines 23-25), a target physical amount reduction degree output section configured to provide a target physical amount reduction degree corresponding to the predetermined intervals of operating time (2, 4, see column 2 lines 25-29), a comparing section configured to compare the physical amount reduction degree to the target physical amount reduction degree at one of the predetermined intervals of operating time (5, see column 2 lines 29-33), and a speed control section configured to control the inverter compressor so that a rotational speed of the inverter compressor is increased when the comparing section indicates that the physical amount reduction degree is smaller than the target physical amount reduction degree, and decreasing the rotational speed of the inverter compressor when the comparing section indicates that the actual physical amount reduction degree is larger than the target physical amount reduction degree (6, see column 2 lines 31-35).

Regarding claim 21, Kobayashi et al discloses the refrigerating storage unit to have a pull down characteristic that is a linear function, with the target physical amount reduction degree being a constant value (see column 2 lines 48-52).

Regarding claims 22 and 23, Kobayashi et al discloses the refrigerating storage cabinet to have a control-cooling characteristic that is a linear function (see column 2 lines 53-58), wherein the target physical amount reduction degree is a constant value.

Regarding claims 25, 26, and 28, Kobayashi et al discloses a physical amount change computing section computing a physical amount reduction degree for the

physical amount based on the physical amount and a previously measured physical amount, wherein each physical amount reduction degree and the appropriate target physical amount reduction degree are used as inputs for the comparing section (temperature deviation detector, see column 2 lines 13-21 and 58-60), which is configured to compute the physical amount reduction degree required based on current conditions. It is noted that Kobayashi et al does not explicitly disclose the use of an exponential function or a table of values as the pull down characteristic or the control characteristic. However, Stamp does explicitly disclose the use of a target time-temperature function which is exponential (see column 11 lines 8-16), or one which is constituted by a table of values. It would therefore have been obvious to one of ordinary skill in the art to use an exponential function or table of values, as in Stamp, in the system of Kobayashi et al in order to provide control of the compressor which is smoother and therefore less wearing.

Regarding claim 30, Kobayashi et al discloses the refrigerating storage cabinet to be configured to store a plurality of cooling characteristics (see column 2 lines 48-68), and the operational control unit to be configured to execute an appropriate one of the cooling characteristics based upon the physical amount.

8. Claims 24 and 27 rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi et al (US Patent No. 4,662,185) in view of Longtin (US Patent No. 5,566,879).

Regarding claim 17, Kobayashi et al discloses a refrigerating storage cabinet (refrigerator, see column 1 line 8) for refrigerating an inner atmosphere and including a

refrigeration unit comprising a compressor (see column 1 line 9) and an evaporator which is inherently present in order to cool the interior of the refrigerator of Kobayashi et al, the compressor including a plurality of performance levels (see column 1 lines 8-10), a storing unit (5, see column 2 lines 16-17) configured to store a cooling characteristic including a target physical amount as a function of operating time (2, Ts, see column 2 lines 23-25 and 57-58), a physical amount sensor which detects a physical amount at predetermined intervals of operating time (1, Ta, see column 2 lines 23-25 and 57-58); an operation control unit (5, see column 2 lines 16-17 and 29-35) which controls the compressor by selecting one of the plurality of performance levels based upon a relationship between the physical amount and the target physical amount for one of the predetermined intervals of operating time (see column 2 lines 31-35 and 58-68).

Further regarding claim 17 and regarding claims 24 and 27, it is noted that Kobayashi et al does not explicitly disclose the target physical amount to change with respect to time. or the control-cooling and pull down characteristics to be quadratic functions. However, Longtin discloses a quadratic function to be the ideal curve for variation of temperature of the controlled area with respect to time (see column 8 lines 29-38) when modeling time-temperature curves. It would therefore have been obvious to one of ordinary skill in the art at the time of the invention to implement the quadratic function of Longtin in the system of Kobayashi et al as the cooling curve, in order to have a realistic time-temperature curve to attain.

Regarding claim 18, Kobayashi discloses the physical amount to be a temperature of the inner atmosphere (Ta, see column 2 lines 23-25), the target physical

amount to be a temperature (Ts, see column 2 lines 26-28), the cooling characteristic to be a pull down characteristic when the physical amount is in a temperature range from above a high temperature to near a set temperature (see column 2 lines 48-52); and the high temperature is higher than the set temperature by more than a predetermined value.

Regarding claim 19, Kobayashi et al discloses the refrigerating storage unit to comprise an upper limit temperature that is higher by the predetermined value than a set temperature (Dn, see column 2 line 48), a lower limit temperature that is lower by the predetermined value than the set temperature (Dm, see column 2 line 54), a control-cooling zone between and including the upper limit temperature to the lower limit temperature (Dm, Dn, see column 2 lines 53-58, see also figure 2) wherein when the physical amount is in the control-cooling zone, the cooling characteristic is a control-cooling characteristic; wherein when the physical amount reaches the lower limit temperature from a temperature higher than the lower limit temperature, the compressor is not operated (see column 3 lines 18-20); wherein when the physical amount reaches the upper limit temperature from a temperature lower than the upper limit temperature, the compressor is operationally controlled by the operation control unit (see column 2 lines 31-35).

Regarding claim 20, the refrigerating storage cabinet of Kobayashi et al comprises a speed-controllable inverter compressor (6, 7, see column 2 lines 19-21), with the operation control unit comprises a physical amount change computing section configured to compute a physical amount reduction degree at the predetermined

intervals of operating time (1, see column 2 lines 23-25), a target physical amount reduction degree output section configured to provide a target physical amount reduction degree corresponding to the predetermined intervals of operating time (2, 4, see column 2 lines 25-29), a comparing section configured to compare the physical amount reduction degree to the target physical amount reduction degree at one of the predetermined intervals of operating time (5, see column 2 lines 29-33), and a speed control section configured to control the inverter compressor so that a rotational speed of the inverter compressor is increased when the comparing section indicates that the physical amount reduction degree is smaller than the target physical amount reduction degree, and decreasing the rotational speed of the inverter compressor when the comparing section indicates that the actual physical amount reduction degree is larger than the target physical amount reduction degree (6, see column 2 lines 31-35).

Regarding claim 21, Kobayashi et al discloses the refrigerating storage unit to have a pull down characteristic that is a linear function, with the target physical amount reduction degree being a constant value (see column 2 lines 48-52).

Regarding claims 22 and 23, Kobayashi et al discloses the refrigerating storage cabinet to have a control-cooling characteristic that is a linear function (see column 2 lines 53-58), wherein the target physical amount reduction degree is a constant value.

Regarding claim 30, Kobayashi et al discloses the refrigerating storage cabinet to be configured to store a plurality of cooling characteristics (see column 2 lines 48-68), and the operational control unit to be configured to execute an appropriate one of the cooling characteristics based upon the physical amount.

9. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi et al (US Patent No. 4,662,185) and Longtin (US Patent No. 5,566,879) in view of Okamoto et al (US Patent No. 4,959,969).

Regarding claim 29, it is noted that Kobayashi et al and Longtin does not explicitly disclose the presence of multiple pull down zones. However, Okamoto et al does disclose the presence of multiple pull down zones (see table I; see also column 3 lines 32-39), with the appropriate one of the plurality of the pull down characteristics executed based on the physical amount. Further, it would have been obvious to one of ordinary skill in the art to implement the multiple zones of Okamoto in the system of Kobayashi et al and Longtin in order to improve efficiency of the system.

Regarding claims 31 and 32, it is noted that Kobayashi et al and Longtin does not explicitly disclose the presence of multiple pull down zones. However, Okamoto et al does disclose the presence of multiple pull down zones (see table I; see also column 3 lines 32-39), with the appropriate one of the plurality of the pull down characteristics executed based on the physical amount. Further, it would have been obvious to one of ordinary skill in the art to implement the multiple zones of Okamoto in the system of Kobayashi et al and Stamp et al in order to improve efficiency of the system.

Regarding claim 33, Kobayashi et al discloses the implementation of a cooling characteristic of a small temperature drop degree when a difference between the physical amount and the target physical amount is less than a predetermined amount, and the appropriate cooling characteristic to include a large temperature drop degree

when the difference between the physical amount and the target physical amount is greater than or equal to the predetermined amount (see column 2 lines 48-68).

Regarding claim 34, it is noted that Kobayashi et al and Longtin does not explicitly disclose the use of an auxiliary cooling characteristic comprising a temperature curve in which a convergence temperature remains at a temperature higher by an auxiliary predetermined value than the set internal temperature, with the auxiliary cooling characteristic selected as the appropriate one of the plurality of cooling characteristics when a difference between the physical amount and an evaporation temperature of the evaporator is at or above a predetermined auxiliary temperature value or when the physical amount is higher than the target physical amount by a predetermined auxiliary temperature value. However, the programming of such a mode in the controller of Kobayashi et al falls within the realm of common knowledge as an obvious mechanical expedient, and it would have been obvious to one of ordinary skill in the art at the time of the invention to implement one of the plurality of modes of Okamoto in the system of Kobayashi et al and Longtin as such an auxiliary mode to promote energy savings in the overall system.

10. Claims 31-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi et al (US Patent No. 4,662,185) and Stamp Jr. et al (US Patent No. 4,328,680) in view of Okamoto et al (US Patent No. 4,959,969).

Regarding claims 31 and 32, it is noted that Kobayashi et al and Stamp Jr. et al does not explicitly disclose the presence of multiple pull down zones. However,

Okamoto et al does disclose the presence of multiple pull down zones (see table I; see also column 3 lines 32-39), with the appropriate one of the plurality of the pull down characteristics executed based on the physical amount. Further, it would have been obvious to one of ordinary skill in the art to implement the multiple zones of Okamoto in the system of Kobayashi et al and Stamp et al in order to improve efficiency of the system.

Regarding claim 33, Kobayashi et al discloses the implementation of a cooling characteristic of a small temperature drop degree when a difference between the physical amount and the target physical amount is less than a predetermined amount, and the appropriate cooling characteristic to include a large temperature drop degree when the difference between the physical amount and the target physical amount is greater than or equal to the predetermined amount (see column 2 lines 48-68).

Regarding claim 34, it is noted that Kobayashi et al and Stamp et al does not explicitly disclose the use of an auxiliary cooling characteristic comprising a temperature curve in which a convergence temperature remains at a temperature higher by an auxiliary predetermined value than the set internal temperature, with the auxiliary cooling characteristic selected as the appropriate one of the plurality of cooling characteristics when a difference between the physical amount and an evaporation temperature of the evaporator is at or above a predetermined auxiliary temperature value or when the physical amount is higher than the target physical amount by a predetermined auxiliary temperature value. However, the programming of such a mode in the controller of Kobayashi et al falls within the realm of common knowledge as an

obvious mechanical expedient, and it would have been obvious to one of ordinary skill in the art at the time of the invention to implement one of the plurality of modes of Okamoto in the system of Kobayashi et al and Stamp et al as such an auxiliary mode to promote energy savings in the overall system.

Response to Arguments

11. Applicant's arguments filed 1/30/09 with respect to claims 35-36 have been fully considered but they are not persuasive.

Regarding all claims, the applicant argues that Kobayashi et al does not teach a change in the target temperature. However, the claims also do not teach a decline in the target temperature over time. The claims teach the target physical amount to be a function of operating time. This is not the same as reducing over time. Therefore, the rejection is maintained.

Applicant's arguments see page 16 lines 1-4, filed 1/30/2009, with respect to claims 17-14 have been fully considered and are persuasive. The rejection of claims 17-34 has been withdrawn. However, upon further consideration, new grounds of rejection have been made in view of Longtin and Stamp.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEXIS K. COX whose telephone number is (571)270-5530. The examiner can normally be reached on Monday through Thursday 8:00a.m. to 5:30p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frantz Jules can be reached on 571-272-6681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/AKC/

/Frantz F. Jules/
Supervisory Patent Examiner, Art Unit 3744